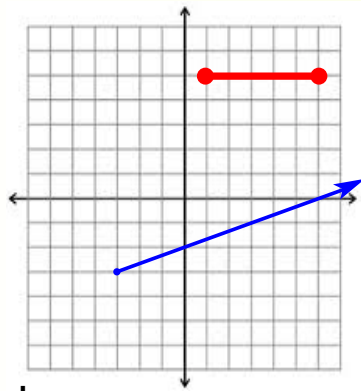


**Alg. 2 Warm Up # 7-5**

Write an equation for each graph, state the domain and range:

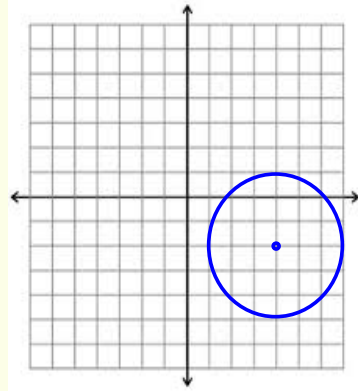
1.



red:

blue:

2.



Classwork Week 7  
Warm up on top  
Salmon  
Yellow

Turn it in.

## HW Questions:

2-146. A parabola has vertex (3, 5) and contains the point (0, 0).

- a. If this parabola is a function, find its equation.

$$y = a(x-h)^2 + k$$

$$y = a(x-3)^2 + 5$$

$$0 = a(0-3)^2 + 5$$

$$0 = a(9) + 5$$

$$\begin{array}{r} -5 \\ \hline 9 \end{array} = \frac{9a}{9}$$

$$y = -\frac{5}{9}(x-3)^2 + 5$$

2-147. Sketch the graph of  $y = 2(x-1)^2 + 4$ .

- a. Now rewrite the equation  $y = 2(x-1)^2 + 4$  without parentheses. Remember the Order of Operations!
- b. What would the difference be between the graphs of the two equations above? This is sort of a trick question, but explain your reasoning.
- c. What is the parent function of  $y = 2(x-1)^2 + 4$ ?
- d. What is the parent function of  $y = 2x^2 - 4x + 6$ ?

$$y = x^2$$

$$y = x^2$$

2-148. Consider the equation  $(x-5)^2 + (y-8)^2 = 49$ .

a. What can you tell about the graph just by looking at the equation?

b. Sketch a graph of  $(x-5)^2 + (y-8)^2 = 49$ .

center (5, 8)  
r = 7

2-149. A line passes through the points (0, 2) and (1, 0).

a. Find the slope of the line.  $\frac{\Delta y}{\Delta x} = \frac{2-0}{0-1} = -2$

b. Find the slope of a line parallel to the given line.

$\frac{1}{2}$

c. Find the slope of a line perpendicular to the given line. {slope opposite & reciprocal}

d. Find the product of the slopes you found in parts (b) and (c).

e. Make a conjecture about the product of the slopes of any two perpendicular lines. Test your conjecture by creating more examples.

$$-\frac{2}{1} \cdot \frac{1}{2} = -1$$

2-150. Write equations for 2 functions, f & g so that the intersect:

a) one point

b) 2 points

c) no points

2-151. Find the  $x$ - and  $y$ -intercepts for the following parabolas.

a.  $y = (x+12)^2 - 144$

b.  $y = (x-8)^2 - 4$

$y$ -int  $y = (0+12)^2 - 144$

$(0, 0)$   $y = 144 - 144$

$y = 0$

$x$ -int

$(0, 0)$   $0 = (x+12)^2 - 144$

$(-24, 0) + 144$   $+144$

$\pm \sqrt{144} = \sqrt{(x+12)^2}$  ★

$\pm 12 = x+12$

$-12$   $-12$

$x = 12 - 12$

or  $x = -12 - 12$

2-152. This problem is a checkpoint for solving linear systems in two variables. It will be referred to as Checkpoint 2B.



Solve the system of linear equations at right.

$5x - 4y = 7$

$2y + 6x = 22$

$$\begin{array}{r} 5x - 4y = 7 \\ 2(6x + 2y = 22) \\ \hline 12x + 4y = 44 \\ 5x - 4y = 7 \\ \hline 17x = \end{array}$$

CP's: 2- #153 ---&gt; 156 (white ws)

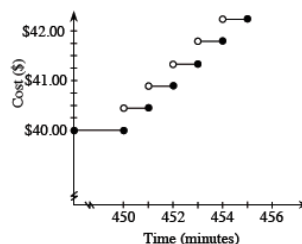
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## 2.2.5 Can I combine functions?

## Transforming Piecewise-Defined Functions

Often the equation for a single familiar function describes a part of a situation, but then is not a good description for the rest of the situation. A step graph is one kind of **piecewise-defined function**. The graphs of these situations are functions, but a single equation is not sufficient to describe them. Describing them requires two (or more) different equations for different inputs. Today you will build new functions by using pieces of familiar functions. Phone plans and water rates are situations that can be modeled using step functions.

- 2-153. The Horizon Phone Company offers a basic monthly voice phone plan where you pay \$40.00 for the first 450 minutes and then \$0.45 per minute after that. The graph at right shows how the plan works.



- This is a piecewise-defined function with many pieces. Describe each piece and the domain and range for the function overall. Then describe the domain and range for the first few pieces.
- Write an equation for each part of the domain.

- 2-154. With your team, create a piecewise-defined function with at least three “pieces.” The function does not need to be a step-function with horizontal line segments, but it needs to meet the definition of a function. Make a table and a graph for your function, and write an equation for each part. Be sure to state the domain for each part, as well as the domain for the whole function.



HW: 2-

# 162 ---> 169

[Next week](#)

Wed: Short quiz #5 and Group Event

Thurs: Chapter 2 Test